Trend Study 13A-8-99

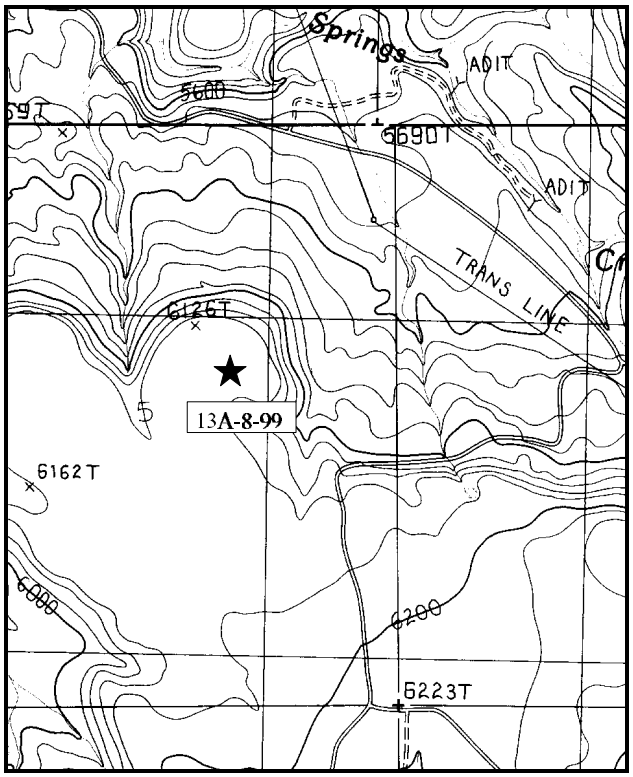
Study site name: Black Ridge . Range type: Chained, Seeded, P-J .

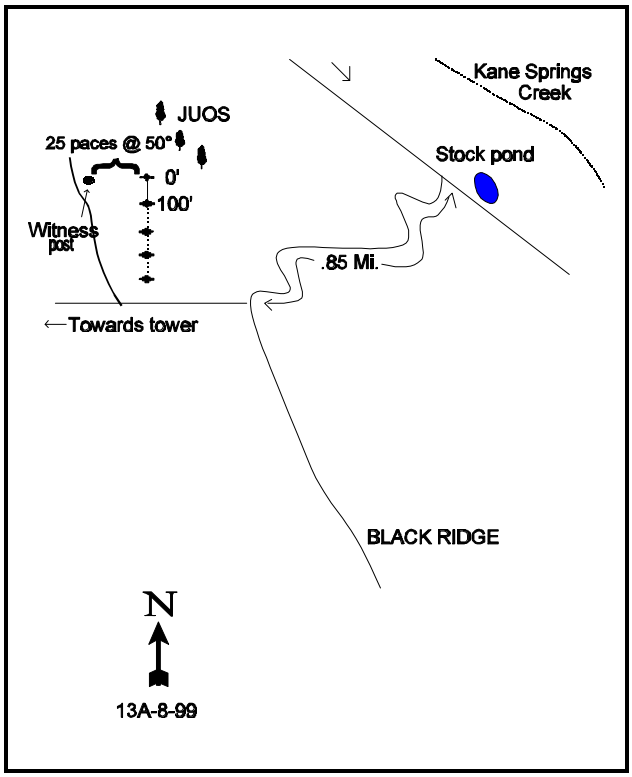
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Travel south from Moab on SR 191 to just past mile marker 113, where a road turns off to Black Ridge and Yellow Circle Mine. Turn left and go 4.5 miles on the main road to the top of the ridge. Turn right onto a faint dirt road bearing west towards the relay tower. Go 0.15 miles to a faint fork. Bear right and continue 0.3 miles. Stop by a witness post on the right side of the road. The baseline starts 25 paces away from the witness post at 50°M. The 0-foot stake is tagged #7173.





Map Name: Kane Springs Diagrammatic Sketch

Township 28S , Range 23E , Section 5 UTM 4250519.850 N, 638718.050 E

DISCUSSION

Trend Study No. 13A-8 (33-8)

The Black Ridge study is one of the lower elevation critical deer winter ranges on the southwest side of the LaSal Mountains. The site is located approximately ½ mile south of the mesas edge, near the middle of the chained area. Slope and aspect are negligible with an elevation of 6,100 feet. This large mesa, managed by the BLM, had been chained many years ago and must have been seeded mostly to crested wheatgrass for that is the only seeded species present at this time. Deer use appears to be greatest along the north rim above Kane Springs Creek. Cattle use the area during the spring, as they move up the mountain to the U.S. Forest Service administered lands. Pellet group surveys of the area in 1999 indicate the following use: 20 cow days use/acre (49 cdu/ha) and 94 deer days use/acre (232 ddu/ha).

The soil is classified as an upland sandy clay loam. Soil on the site appears to be moderately deep (effective rooting depth of almost 16 inches) and mostly free of rock. There are no gullies or other evidence of significant water caused erosion. Wind erosion does cause soil movement on this site due to the high percentage of unprotected, loose sandy soil. The soil is mildly alkaline (7.5 pH). Besides annual precipitation, site potential can also be limited by the amount of phosphorus in the soil (5.8 ppm where 10 ppm is thought to be the minimum for normal plant development) and the moderately high soil temperatures (69°F at 17 inches). These higher soil temperatures and early spring use by livestock will severely limit the persistence of cool season grasses. These site features favor winter annuals like cheatgrass.

Wyoming big sagebrush is unquestionably the dominant browse over a large area. In 1994, the sagebrush provided almost 15% cover with an estimated population of 4,180 plants/acre. They currently provide only about 12% cover and their numbers have decreased by 21% to 3,300 plants/acre. Young plants were surprisingly abundant (72% of the population) in 1987, now they have gone from 6% (1994) to 4% (1999) of the population. Biotic potential (proportion of seedlings to population) was moderately high in 1987 (36%). This has gone from 25% (1994) to zero in 1999. Twelve percent of the population had exhibited heavy use in 1987. This has now gone from 4% (1994) to 42% in 1999. Those individuals displaying poor vigor have increased from 1% (1987) up to 18% (1994), to where it is now down to 4% (1999). Percent decadence had increased significantly from 3% (1987) to 23% (1994). It is currently at 13%. The one parameter that best illustrates the effect of long term drought to this low elevation sagebrush community is the ratio of dead to live plants which is one dead for every eight live plants. How can one get a real handle on what is happening to this sagebrush community? The following four basic parameters show fundamentally what is happening to this community: strip frequency is down, population is down by 21%, cover values are down, and average crown diameter is reduced. Trend for Wyoming big sagebrush is down. A nearby clump of mature juniper shows pronounced highlining, but there is visibly very little evidence of invading young trees on this dry site.

The seeding had established a fair stand of crested wheatgrass, although it has significantly decreased in nested frequency value with the prolonged drought from 1987 through 1994. Although this trend continues, it is at a slower rate. In some places crested wheatgrass is almost a monoculture. Diversity is very low throughout this community. Other perennial grasses observed in the area include Indian ricegrass, bottlebrush squirreltail, and three-awn. Annual grasses made up almost 20% of the grass cover in 1994, now they make up 39% of the grass cover. Forbs are almost nonexistent contributing less than 1% of the vegetative cover in 1994. Only one species was sampled in 1999, occurring in only a single quadrat. On average, Wyoming big sagebrush and crested wheatgrass make up 88% of the total vegetative cover.

Percent litter cover has continually decreased since 1987. With the continuing drought, it is at its all time low of 16%. Percent bare soil is at its highest since 1987 at 61%. Total vegetative cover is fairly low for this type of site, but soil erosion is still quite low because of the level terrain.

1994 TREND ASSESSMENT

The trend for soil is stable even with the large amounts of bare ground and low litter cover because of the mitigating physical characteristics of the site. Browse trend is down because of the increased rates of decadency, increased numbers of plants expressing poor vigor, and fairly high ratio of dead to living plants. The herbaceous understory trend is stable with the nested frequency values for perennial species being fairly stable, but the understory species are still in fairly poor condition with regard to productivity and species diversity.

TREND ASSESSMENT
soil - stable, but poor condition
browse - down
herbaceous understory - stable, but poor condition

1999 TREND ASSESSMENT

The tend for soil is slightly down with decreases in litter cover, decreases in vegetative cover, and increases in percent bare soil. Even with these poor conditions, erosion is minor on this site because of the moderating physical characteristics of the site. Trend for sagebrush continues to be down because of continued losses in numbers, strip frequency is decreasing, no seedlings, and percent young has decreased to only 4% of the population. The ratio of dead to living plants is still relatively high at one for every 10 plants. The herbaceous understory trend is down for perennials as well as for annuals. Only a single forb was found on this site in 1999.

TREND ASSESSMENT
soil - slightly down, continued poor condition
browse - down
herbaceous understory - down, very poor condition

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	$_{b}$169	$_{a}$142	$_{a}$145	72	56	60	5.48	3.14
G	Aristida longiseta	$_{a}$-	$_{b}$8	$_{ab}$4	-	3	1	.09	.03
G	Bromus tectorum (a)	-	192	197	-	68	66	1.47	2.03
G	Sitanion hystrix	$_{b}$21	$_{c}$43	$_{a}$4	12	18	2	.11	.01
G	Vulpia octoflora (a)	-	$_{b}$91	$_{a}$9	-	37	4	.23	.02
Total for Annual Grasses		0	283	206	0	105	70	1.71	2.05
Total for Perennial Grasses		190	193	153	84	77	63	5.69	3.18
Total for Grasses		190	476	359	84	182	133	7.40	5.24
F	Astragalus amphioxys	1	-	-	1	-	-	-	-
F	Descurainia pinnata (a)	-	3	-	-	1	-	.00	-
F	Eriogonum cernuum (a)	-	$_{b}$47	$_{a}$-	-	19	-	.12	-
F	Eriogonum ovalifolium	5	-	-	2	-	-	-	-

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
F	Lappula occidentalis (a)	-	$_{b}$5	$_{a}$-	-	4	-	.02	-
F	Machaeranthera grindelioides	$_{b}$15	$_{a}$4	$_{a}$1	6	2	1	.01	.00
Total for Annual Forbs		0	55	0	0	24	0	0.15	0
Total for Perennial Forbs		21	4	1	9	2	1	0.01	0.00
Total for Forbs		21	59	1	9	26	1	0.16	0.00

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 8

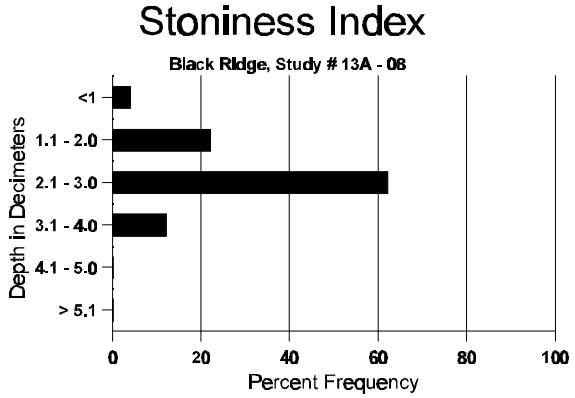
Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Artemisia tridentata wyomingensis	78	75	14.63	11.89
B	Atriplex canescens	0	0	-	-
B	Ephedra viridis	0	0	-	-
B	Gutierrezia sarothrae	0	0	-	-
B	Opuntia spp.	2	1	.38	-
B	Sclerocactus	0	0	-	-
Total for Browse		80	76	15.01	11.89

BASIC COVER --
Herd unit 13A, Study no: 8

Cover Type	Nested Frequency '94	'99	Average Cover % '87	'94	'99
Vegetation	323	287	7.00	20.77	16.72
Rock	24	-	0	.05	0
Pavement	53	54	0	.12	.28
Litter	389	350	40.50	29.28	15.99
Cryptogams	44	57	.75	.41	1.38
Bare Ground	351	372	51.75	54.25	60.84

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 08, Study Name: Black Ridge

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.7	68.8 (17.1)	7.5	56.9	19.8	23.3	10.4	5.8	19.2	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 8

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	59	17	N/A
Deer	45	29	94 (232)
Cattle	-	-	20 (49)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	87	84	-	-	-	-	-	1	-	-	80	5	-	-	2833			85
	94	51	-	-	2	-	-	-	-	-	53	-	-	-	1060			53
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	115	50	2	-	-	-	1	-	-	166	1	1	-	5600			168
	94	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
	99	2	3	1	-	-	-	-	-	-	6	-	-	-	120			6
M	87	-	38	21	-	-	-	-	-	-	54	3	2	-	1966	23	33	59
	94	117	24	3	-	2	-	-	-	-	134	-	12	-	2920	19	32	146
	99	2	78	49	-	-	8	-	-	-	137	-	-	-	2740	19	30	137
D	87	-	2	6	-	-	-	-	-	-	7	1	-	-	266			8
	94	36	5	6	-	3	-	-	-	-	22	3	18	7	1000			50
	99	1	9	8	-	-	4	-	-	-	15	-	-	7	440			22
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	320			16

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	38%	12%	01%	-47%
'94	16%	04%	18%	-21%
'99	55%	42%	04%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'87	7832	3%
	'94	4180	24%
	'99	3300	13%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	24	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Ephedra viridis																		
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	20	22	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	100%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	0		-

Gutierrezia sarothrae																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33	12	13	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	25	3
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5	5	1
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	-67%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	60		-
	'99	20		-

Sclerocactus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	3	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-